

Preventative Maintenance Schedule

The City requires that the Contractor will perform preventative maintenance on all signal equipment. A traffic signal includes, but is not limited to: traffic signal controller and cabinet and all appurtenant equipment, service cabinet, flashing beacons related to traffic signal operations (i.e. advanced warning beacons), pedestrian and vehicle signals, detector systems, video detection camera systems, CCTV camera systems, wireless vehicle detection system, interconnect cable (copper and fiber optic), wireless communications equipment, traffic signal communications equipment, emergency vehicle preemption system, uninterrupted power supply system, intersection safety lighting, internally illuminated street name signs, and radar speed signs related to traffic signal operations.

The Contractor shall use a Windows-based computerized maintenance and inventory management system to record all work done as outlined in the Scope of Work. The Preventative Maintenance database shall be continually updated. The City shall have access to the database via the internet as well as an updated hard copy of the database that shall be furnished to the City on a monthly basis. All records shall be updated in real time by the contractor via Smartphone or similar device.

Upon completion of each Preventative Maintenance inspection detailed in this schedule, the contractor shall supply a computerized report to the City Traffic Engineering Division itemizing each check performed and the result of that check. A separate report shall be generated for the monthly, quarterly, and annual, even when all of these checks occur in the same month.

The Contractor shall also provide a computerized monthly report to the City Traffic Engineering Division of the Community Development Department by the fifteenth day of each month that summarizes the pending repair work needed at each intersection. This report shall be broken down by intersection and be separate from the Preventative Maintenance Report. This may be provided by hard copy or by email on the 15th day of each month.

The contractor shall perform the following **Monthly Preventative Maintenance** inspections and corrective work every month.

1. Controller Cabinet

- Test and Check ground fault receptacle
- Observe the general appearance of the cabinet, noting any rust or other signs of deterioration and complete/recommend repair work if needed
- Inspect door gasket condition and replace if necessary
- Inspect door lock operation and replace if necessary
- Operate and inspect ventilation fan and cabinet light (where applicable)
- Inspect for pests in cabinet and take corrective action if needed
- Visually inspect all relays, photocells, cabinet locks, cabinet fans, switches and make routine adjustments and repairs as necessary

- Move the fan thermostat setting and determine if fan is operable. Return thermostat to proper setting
2. Signal Controller
 - Visually inspect signal controller and controller cabinet components for proper operation and make repairs/replacements as necessary
 - Check timing of individual signal phases. Contractor shall notify engineer immediately of any operational issues (i.e. skipped or omitted phases). The contractor shall not make any timing changes unless it is a matter of public safety or is needed for the proper operation of the traffic signal.
 3. Signal & Pedestrian Heads
 - Visually inspect all vehicular and pedestrian signals for proper operation and replace outages. Replace all burnt out or flickering indications with LED indications
 - Walk intersection and visually inspect all signal heads including backplates, visors and indications for proper operation and alignment. Replace all broken parts, align signal heads and adjust all mast arm signs as necessary
 - Check that all pedestrian signals are in good condition, aimed properly and make adjustments as necessary
 4. Pedestrian Push Buttons
 - Actuate each button for proper operation. Visually inspect and note condition. Replace or repair any broken or defective pedestrian push buttons. All new pedestrian push buttons shall be two inch ADA push buttons
 - Check all audible and tactile pedestrian signal are in good condition and properly positioned (where applicable) and make repairs as needed
 5. Battery Backup Systems
 - Test battery backup system
 - Test battery charge and replace as needed
 6. Interconnect Communication
 - Check operation
 - Visually inspect cables, antenna, and other hardware and make repairs as needed
 7. Miscellaneous
 - Visually inspect other signal hardware
 - Correct and/or report all deficiencies
 - Check operation of flashing beacons at signalized intersections to ensure proper operation

In addition to the monthly maintenance report, the Contractor shall conduct **Quarterly Preventative Maintenance** and submit a report that shall include all of the following elements. Quarterly maintenance shall take place in the months of July, October, January and April:

8. Detectors and Loops

- Visually inspect for exposed wires, cracks, and/or pot holes and make repairs or recommendations for repair as needed
- Check and tune detector amplifiers

9. Pull Boxes

- Check Pull box and lid condition and replace/repair as needed
- Check condition of splices and make repairs as needed
- Clear any debris from pull boxes

10. Controller Cabinet

- Measure voltage level at service entrance in cabinet and record
- Vacuum and clean controller cabinet and contents

11. Battery Backup Systems

- Test battery backup system
- Test battery charge and replace as needed
- Measure voltage level at service entrance in cabinet and record
- Vacuum and clean cabinet and contents

12. Emergency Vehicle Pre-Emption

- Actuate preempt to check operation with Emergency Vehicle Pre-emption Emitter and make repairs as needed.
- Visually inspect cables, antenna, and other hardware

In addition to the monthly and quarterly maintenance the Contractor shall conduct **Annual Preventative Maintenance** and submit a report that shall include all of the following elements. Annual maintenance shall take place in each month with the traffic signals being segmented into 12 equal zones:

13. Controller Cabinet

- Replace cabinet air filter
- Lubricate hinges and lock

14. Signal Heads

- Clean and polish all signal lenses and reflectors (including video detection and CCTV cameras, and emergency preemption detection lenses), align signal heads and adjust all mast arm mounted street name signs
- Clean and polish all lenses and reflectors

15. Signal System Assessment

- Perform conflict monitor test and submit printout
- Check for water accumulation and reseal ducts

16. Miscellaneous

- Check any other equipment utilized during the term of the Agreement but not specifically listed
- Anchor bolts tightened
- Adjust all mast arm mounted street name signs as needed
- Check condition of paint (frameworks, heads, cabinet, poles, and other appurtenances) and make recommendation for repainting as needed.
- Check cabinet inventory list and update as needed.

17. Night Inspections

- Walk intersection and check for proper visibility and operation of traffic signal heads, pedestrian signal heads and flashing beacons
- Check operation of safety lighting and recommend repair and replacement to City Traffic Engineering Division as needed
- Check operation of internally illuminated street name signs and conduct repair and replacement as needed
- Radar Speed Signs (used in conjunction with traffic signals only)
 - Check operation of Radar Speed Signs and adjust radar unit alignment as needed
 - Clean protective sheeting
 - Check seals and make repairs as needed
 - Check batteries and replace as needed
 - Check connections and tighten if needed